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A Taxonomic Study of the Boubou Shrike in Southern Africa

Much confusion currently prevails concerning the taxonomic groupings best employed in describing the variation exhibited by the various forms of the highly polytypic Boubou Shrike, **Laniarius ferrugineus** (Gmelin) and **L. aethiopicus** (Gmelin) of the Ethiopian Region. The conservative approach, supported by the work of Roberts (1940), Sclater (1930), and Rand (1960), favours recognising virtually all the forms as races of one species (**L. ferrugineus**), whereas Smithers et al. (1957), Benson & White (1957), Mackworth-Praed and Grant (1955), and Hall (1953), arrange this rather cumbersome unit of some 15 races in two or more discrete species.

Of all the authorities who have expressed an opinion on the subject under review, few appear to have actually undertaken a complete revision, utilising the accumulated skin material from the available museums, one notable exception being Mrs. B. P. Hall (loc. cit.), whose considered findings are based on the critical examination of a large panel of approximately 500 skins. This study led this worker to the conclusion that the group is best regarded as a superspecies, consisting of 4 species, viz., **L. ferrugineus**, **L. aethiopicus**, **L. bicolor** (Verreaux), and **L. turatii** (Verreaux).

Recognition of taxonomic distinction of a higher rank than the subspecies between **L. ferrugineus** and **L. aethiopicus** was not approved by the S.A.O.S. List Committee (1960), in respect of the South African forms. Traylor (1962) also accepted this decision, but then went on to show that the relationship between **L. ferrugineus** and **L. bicolor** was not so easily resolved, as in some areas of contact between these two forms the birds behaved as discrete species, segregated along ecological lines, whereas in other parts, intergradation as between two orthodox races of a single polytypic species is in evidence (cf. rejungent species).

In order to try and resolve these conflicting taxonomic views and bring about some measure of uniformity in the formal subspecific arrangements of the populations, a detailed study, involving approximately 700 specimens, was recently carried out at the East London Museum. Despite this large accumulation of material and much time spent on the study thereof, it was still not possible to deal with many of the geographical forms extralimital to Zoogeographical South

Africa. Attention was thus focussed on the more austral races with the idea of supplementing Mrs. Hall's study, which author had, by her own admission, insufficient material from these parts of Africa.

Up to the date of the preparation of this revision, a full appreciation of the extent and complexity of the variation this shrike displays has been denied systematists because of the inadequacy of the descriptive literature. This is especially applicable to material of the Southern African faunistic zone where classification and range definition are still largely guesswork, based as they are on the old, brief and somewhat conflicting descriptions of Roberts (1922, 1924 and 1940). A valuable contribution towards putting the races of Natal and Zululand on a modern footing has recently been made by Clancey (1964).

In this revision I have also endeavoured to throw more light on the vexed relationship between what has been known as the Tropical Boubou (the **aethiopicus** group) and the Southern Boubou (the **ferrugineus** group). Although Hall's 1953 account devotes space to such an appraisal, she had insufficient material of the two forms from along the entire length of the zone where the extremities of their ranges approach each other closely but still only just remain allopatric. Thus the matter was not fully resolved. Such a gap I hope to fill by the data now derived from additional material, especially from Mocambique.

With a good series of specimens from the Eastern Province and Natal littoral, which has only fairly recently been accumulated, and the combined resources of various institutions, it has been possible to view a full and truer picture of the total spectrum of variability than was hitherto possible. While this study has not shown the necessity of erecting new subspecies, some rearrangement of the ranges of existing taxa has become necessary, plus the recording of some local populations or micro-subspecies, which could with more collecting perhaps necessitate recognition as additional races.

Before considering the characters of individual taxa or even general variation trends, it is first necessary to review the group as a whole throughout its entire range. This, as indicated, covers most of the Ethiopian region, the birds of which are broadly divisible into three major groups, **i.e.** the **aethiopicus**, **bicolor** and **ferrugineus** complexes. (The position of **Laniarius turatii** is somewhat obscure, but for the purposes of this study need not be taken into account.)

GEOGRAPHICAL VARIATION

This shrike is extremely plastic and the picture presented by each racial taxon is not infrequently blurred my mutations and local variants, and almost every race contains some individuals that in some respects show characters diagnostic of other races. These resemblances may even be between races whose ranges are far removed from each other. Thus, a few Knysna females attributable to L. **ferrugineus ferrugineus** resemble on the underside their counterparts of the Pondoland coast attributable to **L.f. pondoensis**. Some females of **L.f. pondoensis**, on the other hand, resemble birds of Natal and the eastern Cape, while some inland Natal birds grouped as **L.f. natalensis** show affinities in certain characters to West Cape birds (**L.f. ferrugineus**) and **L.f. transvaalensis**. Moreover, some eastern lowveld individuals of the latter race are not unlike birds of the Natal coast, and so on.

However, it would be a definite mistake to lump all these forms together under one subspecies. In series, quite orthodox geographical variations and groupings are obvious. These groupings of populations into conventional subspecies are convenient in revealing the high plasticity of **L. ferrugineus**, resulting in local changes in mean rainfall, humidity and vegetational cover, bringing about readily demonstrable colour variation of a localised nature.

THE FERRUGINEUS GROUP

Variation within this assemblage of forms follows the normal pattern in birds, being darkly coloured in the west Cape and eastward to Humansdorp. This discrete form is recognised in this treatment as the nominate race **L. ferrugineus ferrugineus** and its range is restricted as detailed under **taxonomic treatment** and does not include Natal and the eastern Cape as in former descriptions.

Eastwards of the range of the nominate race a sharp transition towards a lightening of the dorsal colours in females and a reduction of ventral rufous in both sexes is demonstrable. This shift, however, does not occur so suddenly along the coast as it does in the drier interior, and populations as far east as East London tend to be mixed. These well marked lighter birds of the Eastern Cape are also visibly larger in size.

The birds of Griqualand East and most of Natal are again about the same size as the nominate race but in most other respects show closest affinity with east Cape birds with which population they are grouped as one race, **viz. L.f. natalensis** Roberts. The light feathers of the underside of the male reach their whitest in this form accompanied by a glistening surface lustre. This feature, however, is somewhat unstable and individual variation is evident.

In Pondoland, a darkly coloured group of populations occurs as an enclave, associated with the higher than average humidity and precipitation peculiar to those parts. To this race the name **L.f. pondoensis** Roberts has been applied.

In northern Zululand and southern Mocambique a well differentiated race, **L.f. tongensis** Roberts, occurs. Here the birds reveal the effect of Bergmann's Law in reflecting the outcome of inhabiting the humid Tropical littoral, being, on the average, as much as 10 mm. shorter in the wing than east Cape birds. Specimens are also decidedly paler in pigmentation especially the buffy caudad underparts of the male. Otherwise the birds are rather like diminutive specimens of **L.f. natalensis**.

From Panda, in the Inhambane district, northwards to the approaches of the Save River **L.f. tongensis** becomes darker with regard to the tone of the ventral buff, and some male specimens are as dark in this respect as many of the males of the more southern races.

The last race of this group, **L.f. transvaalensis** Roberts, is the only race with no contact with the littoral and is mainly a form inhabiting the more elevated parts of Natal, Swaziland and much of the Transvaal. It is characterised by a reduction in sexual dimorphism in that the breast of the male loses the white sheen giving way to a duller off-white tinged with buff, showing thus, approaches to the corresponding parts of the female. Dorsally the females revert to the dark hues of the nominate race.

Thus it will be seen that the nominotypical race is most closely allied to **L.f. transvaalensis** while the littoral populations of the eastern sector **viz. L.f. natalensis**, **L.f. pondoensis** and **L.f. tongensis** also form a rather compact group of closely related forms.

The males of the **ferrugineus** group give the impression of being shiny black dorsally, but if looked at under good lighting conditions, it is sometimes only the head and anterior portion of the mantle that are quite black, with the rest of the dorsal surface tinged to varying degrees with a dark greyish-olive. Often this suffusion does not cover more than the feathers of the rump. However the suffusion that invades the backs of the males of **L.f. tongensis** occurring from Panda northwards is much more conspicuous and of a different tone, being lighter and purer grey.

There is a slight tendency for the backs of males of the **ferrugineus** group to become glossier black from south to north. Actually the males with the purest, shiniest black backs are the representatives of **L.f. tongensis** that inhabit the southernmost parts of the subspecies' range.

THE AETHIOPICUS GROUP

In this group there is no indication of secondary sexual dimorphism and by comparison with the **ferrugineus** group there is little to describe in the nature of variation within the populations that occupy Rhodesia, Zambia, Malwai and the northern parts of Mocambique. Dorsally all the birds are a shiny blue-black, which is a very constant feature of the forms of the **aethiopicus** group.

The most evident variation is a slow somewhat irregular, cline in the intensity of the ventral coloration, from Zambia southwards over Rhodesia.

In comparing birds from Zambia, Malawi and the adjacent low-lying regions of Mocambique with those from most of Rhodesia, it will be noticed that the Rhodesian populations are distinctly darker ventrally. Birds of the northern parts of Zambia are virtually white below, with but little buff on the under tail-coverts, while the birds of the greater part of Rhodesia are mostly a medium shade of buff or peach from the throat to the under tail-coverts, the intensity of this colour increasing caudad. Immature specimens of the Rhodesian populations are much buffier than adults, though this is not nearly as noticeable in comparable specimens from Zambia.

Seeing there are no indications of the adult bird populations becoming darker or buffier towards the approaches of the Limpopo River Valley or south-eastern Rhodesia, the name **L.a. limpopoensis** will be used to include all the birds of Rhodesia except for parts of the Zambezi Valley and the remote eastern border. In these parts there are indications of the birds becoming whiter ventrally, especially in those occurring in the upper reaches of the Zambezi Valley west of Chirundu.

The range of **L.a. mossambicus** will therefore have to be shifted northwards in Rhodesia. Whether the birds of the central and southern reaches of Zambia are sufficiently distinct from **L.a. limpopoensis** to be included in the race **L.a. mossambicus** I leave future workers to decide. It will also have to be decided whether the race **L.a. mossambicus** as now defined is sufficiently distinct from **L.a. major** to stand as a discrete subspecies.

It has been found by Rosa Pinto (1958) that **L.f. limpopoensis** also reaches into Mocambique along the mountainous regions of the south-eastern borders of Rhodesia. Birds taken at Espungabera and examined personally, confirm this finding.

THE BICOLOR GROUP

The races of this group are as the name indicates, simply black above and white below, and the variation in and between the races is even less marked than in the **aethiopicus** group.

L.f. sticturus penetrates our faunistic zone along the Caprivi Strip and south to Maun in Ngamiland, keeping much to the swampy parts of this area.

TAXONOMIC INTERRELATIONSHIPS BETWEEN THE GROUPS

On **prima facie** grounds there are quite adequate reasons for recognising the three major groups discussed above as discrete species. However a careful study of the impinging or overlapping populations of these groups reveals some complex and interesting genetic relationships.

From this study it has become clear that the three groups cannot always be safely regarded as good species, nor are they merely all races of one species. There exists among these contiguous and overlapping populations every phase of evolutionary development from the species level, **via** rejungent and semispecies, to straight forward intergradation typical of subspecies in initial or secondary contact.

The genetic relationship between the **L. bicolor** and **L. aethiopicus** forms is fortunately easier to understand because of an overlap in the ranges, than in the case of **L. aethiopicus** and **L. ferrugineus** forms, since the latter two closely approach one another, but do not overlap.

It has been very generally accepted that **L. bicolor sticturus** Finsch and Hartlaub is specifically discrete from **L. aethiopicus mossambicus**, there being no evidence of hybridisation where their distribution narrowly overlaps in the more southern part of their ranges along the Caprivi Strip. However, this settled opinion has recently been questioned by Traylor (**loc. cit.**), who found evidence of intergradation between another two races of these same "species", i.e. **L.b. guttatus** and **L.a. major** in central and northern Angola, thus setting the stage for recognising these forms as components of one reiungent species, and for posing the recurring problem of expressing this adequately, from a nomenclature point of view.

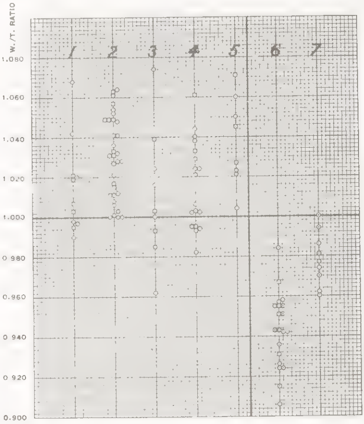
No comparable evidence can be produced in support of the definite allocation of the **L. ferrugineus** and **L. aethiopicus** groups of forms since, to date, no locality has been found where their ranges overlap, although the possibility of this occurring is not unlikely.

After having reviewed the nature of the variation within the three major groups of Boubou Shrikes it would probably be expedient at this stage to focus attention on a comparison of these contiguous populations of the **L. aethiopicus** and **L. ferrugineus** groups as they occur in northern Transvaal, eastwards into Mocambique. For the sake of clarity the birds will be referred to by name in this part of the text, utilising the names employed by those who regard the two forms as discrete species. Thus we have **L. aethiopicus limpopoensis** and **L.a. mossambicus** as representatives of the Tropical Boubou occurring north of latitude 23°S in the northern Transvaal and Mocambique respectively and **L. ferrugineus transvaalensis** and **L.f. tongensis** representing the Southern Boubou and occurring south of the same line of latitude. Only males were used for measurement in order to eliminate the possibility of wrong sexing and immature males being confused with adult females. In **L. ferrugineus** adult males are quite unmistakable. Wing and tail-measurements were used, as they appear to be the easiest and best means of assessing overall size.

Although the two forms approach to within some 50-100 miles of each other in the northern Transvaal and the Sul do Save of Mocambique, their ranges have as yet not been found to overlap. The only geographical barriers separating their ranges are the Zoutpansberg mountains and the Save River respectively. These in themselves would, however, appear to be quite inadequate as physical barriers to restrict their ranges, and the answer most probably is to be found in habitat preferences, governed by differences of climate and vegetation. **L.a. limpopoensis** for example, appears to be at home in the Mopani veld (Acocks 1953) to the north of the Zoutpansberg range, while **L.f. transvaalensis** occupies tracts of various Bushveld types to the south of that range.

One of the characters worthy of elaboration in this comparison between the two populations is size. This is most striking in the northern Transvaal representatives of **aethiopicus** and **ferrugineus**, whereas in Mocambique colour differences most easily separate these two forms.

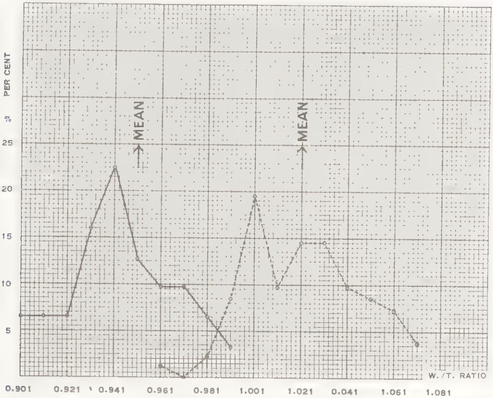
With regard to wing and tail dimensions we find that there is a remarkable increase in tail-length in **L.a. limpopoensis** when compared with **L.f. transvaalensis**. This by itself would not be so significant were it not for the fact that this sudden increase in tail-length is not accompanied by a corresponding increase in the wing measurement. This means that the proportion between wing and tail measurements of **L. aethiopicus limpopoensis** is quite different from that of **ferrugineus** or any of its races.



GRAPH A Graphical illustration of the distribution of the wing/tail ratios of individual birds about 1.000 (bold horizontal line) which is where wing and tail are of equal length. The L. **ferrugineus** races are figured to the left of the bold vertical line. Numbered columns represent the following subspecies:

1. **Laniarius ferrugineus ferrugineus**
2. " " **natalensis**
3. " " **pondoensis**
4. " " **transvaalensis**
5. " " **tongensis**
6. " **aethiopicus limpopoensis**
+ 7. " " **mossambicus** and others intergrading with **L. a. limpopoensis**

+ These specimens included for comparison



GRAPH B A frequency distribution showing the percentage of distribution of the two groups for the various wing/tail ratios as shown in graph A. Solid and broken lines represent the L. **aethiopicus** and L. **ferrugineus** groups respectively.

GRAPH B A frequency distribution showing the percentage of distribution of the two groups for the various wing/tail ratios as shown in graph A. Solid and broken lines represent the L. **aethiopicus** and L. **ferrugineus** groups respectively.

It was found that the difference between the means of the wing/tail ratios for the two groups (**ferrugineus** and **aethiopicus**) is very highly significant. Thus the difference was found to be 0.069 whereas the required difference for significance at the 1% level is only 0.017. In contrast to this the variation within the groups is very low giving a co-efficient of variation of only 2.1%.

It will be seen under taxonomic treatment that the average tail measurement of the various races of L. **ferrugineus** never exceeds the average wing measurement, whereas in populations of L. a. **limpopoensis** the average tail measurement is never less than the average wing measurement. In this connection it should be noted that there is no evidence of a cline in the wing/tail ratios which could connect populations of L. **ferrugineus** with those of L. **aethiopicus** in Southern Africa. In **L.a. limpopoensis** and **L.a. mossambicus** such a cline does appear to exist but this runs in an east/west direction, effected thus by the influence of the littoral and quite unrelated to the races of L. **ferrugineus** situated immediately to the south. On the other hand, the various races of L. **ferrugineus** have their wing/tail ratios fairly constant with no similar tendency for littoral populations to be markedly different from those further inland.

It is interesting to note that where two forms of Boubou Shrike do behave as discrete species (where their ranges overlap) there is a corresponding difference in physical dimensions. This is to be found among representatives of **L.a. mossambicus** and L. **bicolor sticturus** which share the same territory along the Caprivi Strip. **L.b. sticturus** here has very much the same wing/tail proportions as L. **ferrugineus**, being only larger in overall size.

As far as culmen height is concerned the two most northern races of L. **ferrugineus** have this measurement about 1 mm. less than most of the more southern races, the variation of averages among all races being from 8.5 - 10 mm. The beaks of **L.a. limpopoensis** and **L.a. mossambicus** are all consistently smaller, varying but little from 8.1 - 8.2 mm.

In Mocambique the more littoral populations of the representative races of these two groups, i.e. **L.a. mossambicus** to the north of the Save River and **L.f. tongensis** to the south, are smaller in overall size and the size differences are not nearly as marked. It is here that colour differences are more worthy of note and again it is obvious that there is evidence of substantially greater differences in plumage colour between contiguous and other populations of L. **aethiopicus** and L. **ferrugineus** than those that normally separate the races of each group.

In this connection it is important to keep in mind that in all the representative forms of L. **aethiopicus** there is a complete absence of sexual dimorphism as far as plumage coloration is concerned. Both sexes in adult dress are glossy blue-black dorsally and there are no exceptions. However, in the **ferrugineus** group variation of dorsal shades and sexual dimorphism is most marked. Only in **L.f. transvaalensis** is sexual dimorphism not particularly apparent; in no cases, however, are the female backs shiny blue-black as in L. **aethiopicus** but like its congeners tend to be variable in shade. The female back of L. **aethiopicus** shows no such variation.

It is also particularly noteworthy that in the adjacent populations in Mocambique sexual dimorphism in **L.f. tongensis** is as well developed as in any other race of **ferrugineus** and quite unlike the populations of **L.a. mossambicus** occurring to the north of the Save River where, as in **L.a. limpopoensis** and other allied races, sexual dimorphism is conspicuous by its absence.

It is felt that the above amply demonstrates that all the constituting elements of each of these two major groups are quite compact and closely knit. In other words each group contains a set of races, each with their own special spectrum or nature of variation.

Both major groups, therefore, can stand on their own with the taxonomical gap separating each one more sharply defined than that which serves to differentiate between the many races of each group.

While all this may favourably impress upon one the necessity for regarding the **aethiopicus** and **ferrugineus** groups as more than racially separable it still does not finally clinch matters when the next stage, specific differentiation, is considered; this in spite of the fact that the two groups have diverged ecologically and morphologically to such a degree that their recognition as species would certainly not lie beyond the bounds of credibility. However, since the two groups still appear to be allopatric, it would be safer at this stage of our knowledge to regard each one as a semi-species. This does not exclude the possibility of the groups being components of a superspecies, the uncertainty arising from the fact that there is no way of applying the objective test.

The intricate relationships between the L. **bicolor**, **aethiopicus** and **ferrugineus** groups are impossible to reflect in the present form of nomenclature. For the sake of convenience and also to prevent obscuring the above picture of these interrelationships, the specific names **aethiopicus**, **bicolor**, and **ferrugineus**, will be retained. Even if proved to be not entirely correct, it is felt that this arrangement certainly lies closer to their true taxonomic positions than grouping all the races of the Boubou Shrike, occurring over the entire Ethiopian region, under one species.

REMARKS

This shrike is a species of thick bushy tangles, in which it is adept at keeping concealed. The type of bush typical of the littoral regions is particularly to its liking and there its beautiful call notes are a feature of the terrain.

However, via watercourses etc., it has established itself in many inland bushy kloofs and open forests. Their inland movement in the Cape has, however, been halted by the barrenness of suitable cover of the Karroid tracts. Thus the Boubou Shrike would appear to be absent from most of the N.W. Cape, Orange Free State, S.W. Africa, Kalahari and the Transvaal Highveld.

The great diversity of colour pattern and shading would appear to be not only the result of a high degree of plasticity in the genetical constitution of the species and featuring thus a higher sensitivity to differing ecological conditions, but also to be fostered by the birds themselves being of more or less sedentary habits. Although this point cannot be proved, it seems a reasonable inference after a consideration of their habits and the many races and forms that have been evolved. An interesting observation in this connection, made by Mr. P.A. Clancey, is that the birds of the **aethiopicus** group occurring in the Limpopo river basin and northwards, are not always to be found in dense thickets and are less secretive. He also notes the possible connection between the typically shy habits and restriction to thick cover and consequent greater development of local colour and voice variation of the more austral races comprising the **ferrugineus** group as compared with the greater uniformity of **aethiopicus** populations.

Mention must be made of yet another factor which serves to make the orderly grouping of this shrike even more difficult. This is the unusually high proportion of individuals that bear signs of immaturity. Especially vexing are the females of the **ferrugineus** group, where from 40 to 80% (usually over 50%) of the individuals bear either the full complement of immature characters, or only one, or even more perplexing, only very faint indications of being in other than adult feather. From what has been observed, it appears that even some fully adult or reproductively mature females may still bear the characters of immaturity. Approximately 80% of the available sample of females of **L.f. pondoensis** should, from outward appearance, be classed as immature. Immature males (which resemble females in the **ferrugineus** group) are far fewer in number and present no problem because of the marked difference of adult males. It seems apparent, therefore, that females, at least of the **ferrugineus** group, retain the characters of immaturity for some lengthy and indefinite period. For this reason it was found quite impractical for purposes of measurement **etc.**, to weed out all the individuals that appear to be other than adult. Only birds with a clear, full complement of immature characters were eliminated. All the individuals attributable to **L.f. pondoensis** had to be used, however.

No immature males were used for measurements. Most obvious of the immature characters are the buff tipping to the wing-coverts, and the bill, especially the lower mandible, being horn-coloured and not black. Immatures may also have a distinct barring of breast feathers, while juveniles have, in addition, russet tipping to the feathers of the back.

Measurements of the wing were made by flattening the curve of the primaries along a ruler. Culmen height was measured vertically over the nostrils.

ACKNOWLEDGMENTS

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My thanks are also due to the Director of the East London Museum, Miss M. Courtenay-Latimer, for advice and encouragement, to Mr. P.A. Clancey, Director of the Durban Museum, for his quite invaluable assistance at all stages of the pursuit of this study and to Mr. D.W.W.Q. Smith, Statistician at the Dohne Research Institute, for his valuable contribution involving the statistical analysis and graphical representation of the wing/tail ratios.

SUMMARY

The historical background of earlier taxonomic treatments, geographical variation and interrelationships of major groupings and finally, the variation and

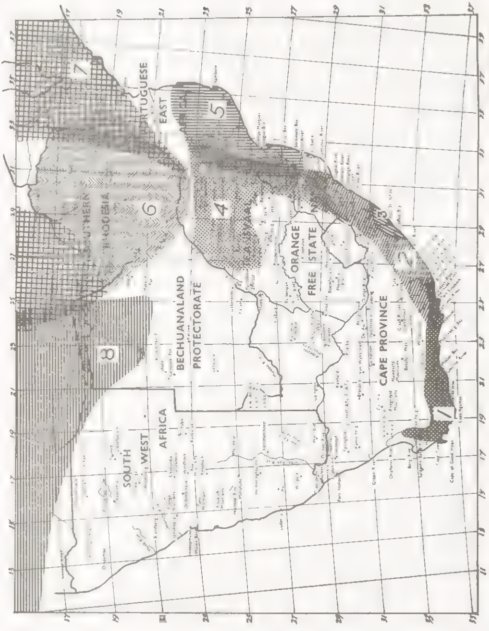
characters of each racial taxon, are discussed. As such it is the first complete revision of the Southern African material of the Boubou Shrike, **Laniarius ferrugineus** Gmelin.

Much controversy surrounds the taxonomic arrangement of the forms of this shrike. This is thought to stem from the lack of adequate descriptive data, these being all the more vitally necessary in the case of this shrike as it is noted for being highly polytypic. Thus the major groups and subspecific taxa have been described in some detail, and various interesting and complex taxonomic relationships have emerged.

It is concluded that the **ferrugineus** and **aethiopicus** groups are semispecies but that the relationship between **bicolor** and **aethiopicus** assumes the nature of a rejungent species.

Map showing the approximate ranges and zones of overlap of **Laniarius bicolor sticturus** Finsch & Hartlaub, and the races of **Laniarius ferrugineus** (Gmelin) and **Laniarius aethiopicus** (Gmelin), occurring within the Southern African faunistic Region.

1. **Laniarius ferrugineus ferrugineus** (Gmelin)
2. " " **natalensis** Roberts
3. " " **pondoensis** "
4. " " **transvaalensis** Roberts
5. " " **tongensis** "
6. " **aethiopicus limpopoensis** "
7. " " **mossambicus** (Reichenow)
8. " **bicolor sticturus** Finsch & Hartlaub


SOUTH WEST AFRICA
BECHUANALAND PROTECTORATE
ORANGE FREE STATE
CAPE PROVINCE
TRANSVAAL
NATAL
SOUTHERN RHODESIA
PORTUGUESE EAST
1
2
3
4
5
6
7
8
Cape of Good Hope
Cape Agulhas

TAXONOMIC TREATMENT
LANIARIUS FERRUGINEUS (GMELIN)
RACES OF THE FERRUGINEUS GROUP

1. **Laniarius ferrugineus ferrugineus** (Gmelin)

Lanius ferrugineus Gmelin, **Syst. Nat.** vol. 1, pt. 1, p. 306, 1788: Cape of Good Hope. Here formally restricted to the Cape Peninsula, Cape Province.

Diagnosis. Sexually dimorphic. **Male**: black to blue-black on upper-parts, with some specimens being glossier than others. Rump of ten tinged with greyish-olive, which sometimes extends up the back. On the underside, the anterior parts are mostly a dull, light creamy white, but certain specimens are a clearer white than others. The posterior portion, including under tail-coverts, thighs and flanks and most of the abdominal feathers, is washed a rich rufous, which colouring is also basal to much of the breast feathering, but lies concealed by the overlapping of the whitish terminal feather portions. However, a rufous feather showing up here and there over the breast is not unusual.

Female: Dark colours predominate, these being shades of blackish-grey, which are rather evenly distributed over the head, neck, ear-coverts, orbital feathers and back. Olive tones are not conspicuous and when present are surface tints showing on the rump, sometimes extending anteriorly over the back. This olive coloration resembles that occurring in **L.f. pondoensis**, and occasional specimens are in fact more profusely washed with olive than others, and thus show some approach to the race of the Pondoland littoral. Underside also a rich rufous, fading anteriorly over the breast to a lighter buff and still further to the throat which is pale buff. Not a few specimens have the breast feathers tipped with smokey grey. Immatures have these areas often more distinctly barred.

Both sexes have the major wing-coverts broadly white. A few of the tertials, usually two, also exhibit white as an edging to the outer web, and the white of the coverts and secondaries tends to meet to form a broad white wing-bar.

Measurements. **Males**: Wing 92.0 - 99.5 (97.9) 13 specimens, tail 92.3 - 100.0 (96.4) 14 specimens, culmen height 9.3 - 10.0 (9.6) mm. 14 specimens. **Females**: Wing 90.5 - 99.0 (94.0) 11 specimens, tail 90.0 - 97.2 (93.2) 8 specimens, culmen height 8.8 - 9.4 (9.0) mm. 8 specimens.

Material. 31 specimens, South-Western Cape (10 males, 10 females), Little Karoo (3 males, 2 females), Southern Cape (3 males, 3 females).

Range. From the Clanwilliam district of the South-western Cape, south and south-east to include most of the Cape districts and the Peninsula. Eastwards the range includes about a 50 - 70 miles coastal strip of the southern Cape terminating, presumably, at the approaches to the Gamtoos River, in the Eastern Cape.

Remarks. Intergrades with **L.f. natalensis** to the east of the Gamtoos River, mainly in a narrow coastal strip to about Alexandria and inland to about Grahamstown.

2. **Laniarius ferrugineus natalensis** Roberts

Laniarius ferrugineus natalensis Roberts, 1922. Ann. Transvaal Mus., 8(4) : 246. Weenen & Dargle districts in Natal uplands. **Type** from Weenen, Natal.

Diagnosis. Male: Similar to the nominate race on the upperside except that there is a tendency for Natal birds to become more blue-black and glossier. From **L.f. ferrugineus** differs below in that the white of the throat and breast extends further posteriorly, thus restricting the rufous suffusion of the belly. Rufous feathers also not reaching as far anteriorly over the flanks. Feathers of the breast, **etc.**, a purer white, often with a glistening surface sheen. Rufous belly suffusion not quite as dark, especially in east Cape birds.

Female: Lighter and greyer than **L.f. ferrugineus** on the upperparts especially over the ear-coverts, which are often distinctly lighter grey than the rest of the dorsal surface. Feathers surrounding the orbit of the eye are often mottled with small off-white markings. This character is typically found well developed only in this race, **L.f. pondoensis** and **L.f. tongensis**. The upperside olive suffusion is better developed, more conspicuous and occurs more frequently. The tone is also rather different, being a lighter shade, with a more greeny-yellow tint, seen to better advantage when the specimen is tilted towards the light at a certain angle. On the under surface again differs from **L.f. ferrugineus** in that females are generally lighter throughout, eastern Cape birds more so than those of Natal. Throat whiter, sometimes showing up as a distinct whitish throat-patch with a fairly sharply defined lower edge. The breast is very pale in many specimens from the drier parts.

Both sexes of the east Cape populations are quite noticeably larger in size than the nominate race. This size difference is even more obvious if the more inland populations of the eastern cape are compared with **L.f. ferrugineus**.

Measurements. Males: Wing 94.0 - 103.0 (100.0) 37 specimens, tail 91.6 - 103.0 (97.3) 33 specimens, culmen height 8.8 - 10.4 (9.5) mm. 34 specimens.

Females: Wing 90.5 - 102.0 (96.2) 28 specimens, tail 90.9 - 99.4 (94.4) 24 specimens, culmen height 8.7 - 9.9 (9.3) mm. 26 specimens.

Material. 131 specimens. Eastern Cape 107; Natal 24.

Range. From the more inland parts of eastern Cape east of the Gamtoos River passing eastwards through Albany north of Grahamstown, and from then on broadening to include the coastal strip, except the moist Pondoland littoral. The range continues through Griqualand East and includes most of Natal.

Remarks. Although this race consists of rather divergent elements, no useful purpose would be served by subdividing it. The eastern Cape populations, although differing somewhat from Natal birds, are strangely enough, more different from **L. f. ferrugineus** (although closer in range) than Natal birds are from the nominate race. However, the kinship between east Cape and Natal birds is clearly evident.

L.f. natalensis intergrades with no less than four other races, i.e. in the south-east with **L.f. ferrugineus**, further north-east with **L.f. pondoensis**, and in the extreme north of its range with both **L.f. tongensis** and **L.f. transvaalensis**, the latter from further inland.

The populations of **L.f. natalensis** occurring in the upper and northern parts of the province of Natal, i.e., Weenen, and White Umfolozi River, and even in one specimen from the Ngoye Forest, near Eshowe, in Zululand, clearly begin to show the characters of **L.f. transvaalensis**, although in size they are close to **L.f. natalensis**. It was from these unstable intergrading populations that Roberts described **L.f. natalensis**. Along the upper Pongola, in northern Zululand, the change-over is virtually complete where typical specimens of **L.f. transvaalensis** occur, accompanied by a rather sudden drop in size.

3. **Laniarius ferrugineus pondoensis** Roberts

Laniarius ferrugineus pondoensis Roberts. 1922. **Ann. Transvaal Mus.**, 8(4):246. Port St. Johns, Pondoland.

Diagnosis. Males not markedly different from those of **L.f. natalensis**, but females most distinctive in that their backs show a climax of olive intrusion, the entire dorsal surface and sides of neck being a pure olive with a strong sepia tone. An occasional specimen reveals some greying about the mantle. About the ear-coverts and orbital feathers the resemblance to **L.f. natalensis** is close, except that the off-white mottling of the orbital feathers is more strongly developed.

Ventrally the females are very dark rufous, as in the nominate race. The sooty clouding of the breast feathers is also the most strongly developed in this race, imparting to the whole under-surface a heavily pigmented appearance. The males are not very distinctive in coloration, but the caudad ventral rufous is very dark.

The culmen is another feature which is best developed in this race with some specimens reaching 10.5 mm. in height at the nostrils. The overall size, however, is small averaging even rather less than **L.f. ferrugineus**.

Measurements. **Males**: Wing 93.0 - 100.5 (96.7) 9 specimens, tail 92.2 - 104.6 (95.7) 14 specimens, culmen height 9.5 - 10.4 (10.0) mm. 11 specimens.

Females: Wing 89.5 - 98.5 (93.5) 12 specimens, tail 89.3 - 98.8 (94.1) 10 specimens, culmen height 9.3 - 10.5 (9.8) mm. 12 specimens.

Material. 30 specimens. All from the Pondoland coastal districts.

Range. The exact range of this race is still very obscure but it is fairly certain to be found in most parts of the Elliotdale, Ngqeleni, Port St. Johns, and Lusikisiki districts. It would seem not unlikely to penetrate the southern littoral of Natal, though not so listed by Clancey (**loc. cit**).

Remarks. This unusual race with its limited range clearly shows the high plasticity of this species, where a small humid and moister than average strip of coast can elicit a response in the genotype to produce this distinct phenotype.

4. **Laniarius ferrugineus tongensis** Roberts

Laniarius ferrugineus tongensis Roberts. 1931. **Ann. Transvaal Mus.**, 14(3) : 240. Manaba, north-eastern Zululand.

Diagnosis. **Male**: Glossed, blue-black dorsally, especially marked in the males of northern Zululand and southern Mocambique. From about Panda northwards the extension anteriorly of an overlay of pure grey from the rump is evident. Ventrally, southern specimens, including the Type-specimen, have rufous over the belly toned down to a light buff. The type, in particular, is among the individuals with the lightest shade of ventral buff found in any specimens of the races of the **ferrugineus** group. Skins from Panda northwards are again much darker, with some possessing rufous tones, reminiscent of **L.f. natalensis**. Such northern examples of **L.f. tongensis** also tend to become pinker or slightly buffy over the white parts of the breast. Specimens to the north-west and west of the range become even more buff, showing the influence of the contiguous **L.f. transvaalensis**.

Female: Not unlike **L.f. natalensis** on the upperparts, but with a suppression of the olive shades, inclining to pure grey. Orbital feathers and ear-coverts similar to **L.f. natalensis**. On the underside again lighter than **L.f. natalensis**, but agreeing in all other respects.

Both sexes are considerably smaller than all the foregoing races, thus:-

Measurements. **Males**: Wing 88.0 - 96.5 (91.9) 14 specimens, tail 85.7 - 94.0 (89.1) 11 specimens, culmen height 7.7 - 9.2 (8.5) mm. 14 specimens.

Females: Wing 84.0 - 91.5 (87.5) 16 specimens, tail 83.4 - 94.4 (87.0) 13 specimens, culmen height 8.0 - 9.0 (8.4) mm. 13 specimens.

Material. 39 specimens. Northern Zululand 6, Swaziland 8, Mocambique 24, including specimens from Panda, Mabote, Funhaloura, Vilanculos etc., and Transvaal 1.

Range. Occupies the low lying coastal plain from the Makatini Flats of northern Zululand to the Save River, Mocambique.

Remarks. As in **L.f. natalensis**, this is another race showing some divergence in the populations occurring at opposite ends of its range, but which at this stage does not appear to warrant sub-division of the present taxon. More collecting from the northern parts of the range may however necessitate a revision of such an opinion.

Intergradation with L.f. **transvaalensis** takes place along a north-south inclined line all along the western borders of Mocambique and eastern Swaziland. Many specimens from the lowlands of eastern Swaziland are typical L.f. **tongensis**. It appears as though L.f. **tongensis** also penetrates the lowveld of the Transvaal as a single male specimen from Newington closely resembles examples of the populations in the northern aspects of its range

5. **Laniarius ferrugineus transvaalensis** Roberts

Laniarius ferrugineus transvaalensis Roberts. 1922. **Ann. Transvaal Mus.**, 8(4) : 246. Swaziland, Barberton, Lydenburg. . . . Rustenburg districts. Type from Leouwe Creek, Barberton.

Diagnosis. The most salient character in the **male** of this race is the almost uniform ventral surface suffused throughout with pinkish buff, not particoloured as in the more southern races, approaching the female in this respect. Chest and throat are, however, often paler than in the female.

The most striking feature in the **female** is the dark blackish-grey of the upperside, ear-coverts, and orbital feathers, which are similar to the nominate race, but in the population of the central regions of the Transvaal these parts are darker. In topotypes and other specimens from the lowveld the dorsal feathers are not so dark and the race is rather like L.f. **natalensis** in this respect.

Ventrally females are again not unlike those of the nominate race except for the ventral rufous being not as saturated, and the almost entire disappearance of any sooty tipping to the breast feathers.

Measurements. **Males**: Wing 89.5 - 99.0 (93.8) 24 specimens, tail 89.0 - 99.7 (93.0) 18 specimens, culmen height 8.0 - 9.1 (8.5) mm. 22 specimens. **Females**: Wing 87.5 - 102.0 (93.8) 17 specimens, tail 85.9 - 102.5 (93.6) 15 specimens, culmen height 8.0 - 8.9 (8.4) mm. 15 specimens.

Material. 54 specimens. Northern Zululand 2, Swaziland 4, Transvaal 48.

Range. A race of the interior plateau of south-eastern Africa, occupying all the more elevated parts of northern Zululand (west of the Lebombos), Swaziland, Transvaal lowveld, middleveld and most of the bushveld of the west, north-west and northern Transvaal.

Remarks. A race of wide distribution and again composed of differing deme elements, with the darker birds occupying the central and more elevated parts of the Transvaal interior.

SOUTHERN RACES OF THE AETHIOPICUS GROUP

1. **Laniarius aethiopicus limpopoensis** Roberts

Laniarius ferrugineus limpopoensis Roberts. 1922. **Ann. Transvaal Mus.**, 8(4) : 246. Lilliput, Sand River, Zoutpansberg district, northern Transvaal. **Diagnosis**. Complete absence of sexual dimorphism in external coloration. Glossy blue-black dorsally and typically buffy below, the shade of this colour increasing in intensity posteriorly. Some specimens are lighter ventrally, being tinged with peach or pink, while occasionally a very pale, almost white specimen is encountered. This race is more darkly coloured below than the one immediately to the north and east, **i.e.**, **L.f. mossambicus**. Series from populations existing in close proximity to **L.a. mossambicus** are therefore lighter. This is evident in birds towards the eastern parts of Rhodesia and the Zambezi valley of Matabeleland. Immatures are a richer buff below than adults.

Measurements. **Males**: Wing 86.5 - 108.0 (98.8) 25 specimens, tail 89.3 - 113.1 (103.9) 22 specimens, culmen height 7.6 - 8.9 (8.2) mm. 19 specimens.

Females: Wing 89.0 - 101.5 (94.1) 21 specimens, tail 91.1 - 107.3 (99.4) 18 specimens, culmen height 7.0 - 8.4 (7.8) mm. 19 specimens.

Material. 90 specimens. 20 from the lowlands of the Limpopo and Sabi/ Lundi River valleys, 8 from the eastern districts (including Rusape); 53 from the interior plateau and 9 from the northern parts of Rhodesia.

Range. The lowlands of the Limpopo River basin, from the northern Transvaal, extending northward into Rhodesia to the Zambezi River Valley where intergradation with **L.a. mossambicus** occurs. Possibly penetrates the southern and more central parts of Zambia. Also penetrates Mocambique to the east of Mount Selinda, in the Melsetter district of Rhodesia.

Remarks. This is rather an unstable race and difficult to define satisfactorily merely by degree of ventral buffiness, which, as indicated, is clinal and subject to quite a measure of individual variation. It is retained for the sake of convenience, and in part to account for the undoubted increased buffiness or darker peach of many of the birds of the greater part of Rhodesia, **i.e.** Matabeleland (except Zambezi valley), the midlands and Mashonaland. Intergradation with **L.a. mossambicus** takes place along the eastern districts and to a lesser extent along the Zambezi valley west of longitude 29°W where most of the birds are clearly attributable to **L.a. mossambicus**.

2. **Laniarius aethiopicus mossambicus** (Fischer & Reichenow)

Dryoscopus major mossambicus Fischer & Reichenow. 1880. **Journ. f. Ornith.** 28 : 141, Mocambique.

Diagnosis. Similar to the previous race, but clearer white below. Underparts typically pale pinky buff or peach with a slight darkening of this colour over the thighs and under-tail coverts. Birds become whiter below towards the north-west and east of the range. Malawi birds are especially white below, with only faint traces of buff about the abdominal surface.

Measurements. **Males**: Wing 88.5 - 100.5 (94.9) 15 specimens, tail

89.0 - 106.0 (98.7) 10 specimens, culmen height 7.7 - 8.3 (8.1) mm. 16 specimens.

Females: Wing 83.0 - 98.5 (91.0) 13 specimens, tail 86.7 - 105.4 (96.1) 11 specimens, culmen height 7.1 - 8.2 (7.6) mm. 12 specimens.

Material. Approximately 35 specimens. 20 from the Zambezi valley west of Chirundu, 5 from the eastern districts; 6 from Malawi and 2 from the south-eastern lowlands of Rhodesia. About 12 specimens also seen from Mocambique, north of the Save river.

Range. Most of the Zambezi River valley, Zambia and Mocambique (north of the Save River) and parts of the eastern districts of Rhodesia. Intergrades with **L.f. major** in northern Zambia, the line of merger being taken as lat. 12^{o}S; also with **L.f. sublacteus** (Cassin) about Dar-es-Salaam, Tanganyika.

Remarks. This race was originally described from Mocambique and when Roberts (1922) reviewed **L.a. mossambicus** he only had specimens from these parts, i.e. the lower Zambezi River and Beira. In the same publication he also introduced the race **L.a. limpopoensis** with specimens from the Limpopo Valley which were quite clearly darker ventrally than birds from the Mocambique littoral. The mistake made by subsequent workers was to overlook the very close affinity of birds from the bulk of Rhodesia (the plateau) with those classified as **L.a. limpopoensis** and to group the former with the ventrally much paler populations of the Mocambique littoral (north of the Save River) under **L. a. mossambicus**.

SOUTHERN RACE OF THE BICOLOR GROUP

1. **Laniarius bicolor sticturus** Finsch & Hartlaub

Laniarius sticturus Finsch & Hartlaub. 1879. **Vog. Ost. Afr.**, p. 342: Lake Ngami, Bechuanaland.

Diagnosis. Sexes alike, and similar dorsally to birds of the **aethiopicus** group. Ventrally it differs in being quite white. The feathers themselves are white throughout their length, whereas in the races of the **aethiopicus** and **ferrugineus** groups a basal buff to the breast feathers is apparent if the feathers are lifted.

Compared to **L.f. mossambicus** this race is conspicuously larger.

Measurements. **Males**: Wing 102.3 - 110.0 (107.4) 5 specimens, tail 100.0 - 109.0 (106.0) 5 specimens, culmen height 7.4 - 7.9 (7.6) mm. 5 specimens.

Females: Wing 102.5 - 108.0 (105.2) 2 specimens, tail 101.0 - 104.6 (102.8) 2 specimens, culmen height 7.7 - 7.9 (7.8) mm. 2 specimens.

Material. 8 specimens. All from a limited area in northern Bechuanaland and the Chobe River.

Range: Penetrating the South African subregion in riverine cover in Bechuanaland and on the Chobe River, narrowly overlapping L.f.

mossambicus along the lower Chobe near its junction with the Zambezi. Extralimitally extends throughout southern Huila, from about the Caculovar River southwards (**vide** Traylor, **Check-list of Angolan Birds**, Q63, p. 178); also to Barotseland (north to Kalabo), in south-western Zambia (**vide** Benson & White, **Check List Birds of N. Rhod.**, 1957, p. 105).

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